Remarks

The Applicant has neither added nor cancelled any claims in this paper. Therefore Claims 16–29 remain pending in this application. Claims 16, 27 and 29 are independent.

Claim Rejections Under 35 U.S.C. § 112(¶2)

The Examiner has rejected Claim 20 under 35 U.S.C. § 112(¶2) as being indefinite for failing to particularly point out and distinctly claim the subject matter which is regarded as the invention. The Applicant has amended Claim 20 to specifically recite that "the composite cathode active material comprises at least two of nickel having an oxidation value of 2.0, manganese having an oxidation value of 4.0, and cobalt having an oxidation value of 3.0. These amendments more clearly define the particular oxidation values recited in the claim. The Applicant respectfully submits that Claim 20 now complies with the requirements of 35 U.S.C. § 112(¶2), and respectfully requests that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a) (Ohzuku)

The Examiner has rejected Claims 16, 17, 19, 20, 22, 26, 27 and 29 under 35 U.S.C. § 103(a) as being obvious based on U.S. Patent Application Publication 2003/0170540 ("Ohzuku"). Claims 16, 27 and 29 are independent.

Ohzuku discloses a coprecipitation method for producing a positive active material (¶ **[0085]**). In one embodiment, the positive electrode active material is composed of a mixture of primary crystalline particles of a lithium-containing oxide having a particle size of 0.1 μm to 2 μm, and secondary crystalline particles having a particle size of 2 μm to 20 μm (¶ **[0031]**).

Claims 16, 17, 19, 20, 22 and 26. In contrast to the disclosure of Ohzuku, independent Claim 16 has been amended to recite a combination of features that includes, among other things, "producing a first lithium metal composite oxide" and "producing, **separately from the first lithium metal composite oxide**, a second lithium metal composite oxide" (emphasis added). Claim 16 further recites that **after** the

first and second lithium metal composite oxides are separately produced, they are then mixed "to form a composite cathode active material for a lithium secondary battery". The method of separately producing first and second lithium metal composite oxides and then mixing these oxides to form a composite cathode active material was disclosed in Applicant's originally-filed application disclosure; see, for example, ¶ 38 (page 9) and ¶ 112 (page 17; "Example 10").

This particular combination of features is not disclosed in Ohzuku. Ohzuku discloses an embodiment wherein the positive electrode active material is composed of a mixture of primary crystalline particles of a lithium-containing oxide having a particle size of 0.1 μm to 2 μm, and secondary crystalline particles having a particle size of 2 μm to 20 μm (¶ **[0031]**). But the Examiner has not pointed to any disclosure in Ohzuku of a method wherein the primary and secondary crystalline particles are separately produced. And, in this context, Ohzuku specifically discloses that "the particle size can be **freely controlled** from a small size to nearly 20 μm" (¶ **[0099]**; emphasis added). Indeed, in characterizing Ohzuku in the 16 February 2011 Office Action, the Examiner states that the process of preparing the primary and secondary particles is composed of "simultaneously" adding the reactants to an apparatus, mixing, and precipitating them.

Amended independent Claim 16 recites a combination of features which is not disclosed by Ohzuku. It would not be obvious to modify the Ohzuku method to obtain the invention recited in Claim 16. The Applicant therefore respectfully submits that Claim 16 is allowable over the teachings of Ohzuku, and respectfully requests that this rejection be withdrawn.

Claims 17, 19, 20, 22 and 26 depend from, and further define the invention recited in, Claim 16. The Applicant respectfully submits that dependent Claims 17, 19, 20, 22 and 26 are allowable over the teachings of Ohzuku for at least the same reasons that independent Claim 16 is allowable, and respectfully requests that these rejections be withdrawn as well.

Claim 27. In contrast to the disclosure of Ohzuku, independent Claim 27 recites a method for preparing a composite cathode active material for a lithium secondary battery by producing a first lithium metal composite oxide, producing a second lithium

metal composite oxide, and mixing the first and second lithium metal composite oxides. Claim 27 defines the first and second lithium metal composite oxides as follows:

Lithium Metal Composite Oxide	Chemical Formula
first	$LiNi_{1-x'-y}Co_{x'}M'_yO_2P_z$
second	selected from the group consisting of: $Li_{1+\delta}[Ni_xMn_{x-y/2}Co_{1-2x-z}M_yN_z]O_{2-a}P_a$ and $Li_{1+\delta}[Ni_xMn_{x+y}Co_{1-2(x+y)}M_y]O_{2-a}P_a$
The parameters M, M′, N, P, δ, x, x', y, z and a are defined in Claim 27.	

The Examiner asserts that the Ohzuku disclosure of using $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ as a lithium metal composite oxide can be read upon $Li_{1+\delta}[Ni_xMn_{x+y}Co_{1-2(x+y)}M_y]O_{2-a}P_a$, which is recited in Claim 27. However, **the Examiner has not pointed to any disclosure in Ohzuku that can be read upon $LiNi_{1-x'-y}Co_{x'}M'_yO_2P_z$, which is recited as the formula for the first lithium metal composite oxide in Claim 27**.

Claim 27 recites a combination of features which is not disclosed by Ohzuku. The Examiner has provided no rationale as to why it would be obvious to modify the Ohzuku method to obtain the invention recited in Claim 27. The Applicant therefore respectfully submits that Claim 27 is allowable over the teachings of Ohzuku, and respectfully requests that this rejection be withdrawn.

Claim 29. Claim 29 has been recast as an independent claim. Claim 29 recites a combination of features that includes, among other things, "producing a first lithium metal composite oxide" and "producing, **separately from the first lithium metal composite oxide**, a second lithium metal composite oxide" (emphasis added). Claim 29 further recites that **after** the first and second lithium metal composite oxides are separately produced, they are then mixed "to form a composite cathode active material for a lithium secondary battery". As expounded above, the particular combination of features recited in Claim 29 is not disclosed by Ohzuku, and it would not be obvious to modify the Ohzuku method to obtain the invention recited in Claim 29.

Claim 29 also recites, among other things, that the reactor includes "an agitator having a first set of rotary vanes designed to induce fluid flow in a first direction and a second set of rotary vanes designed to induce fluid flow in a second direction that is reverse from the first direction". This particular combination of features is not disclosed by Ohzuku. Specifically, Ohzuku discloses two separate reactor configurations. One configuration, illustrated in Figure 1, includes an agitating rod that causes a downward force to be applied to a precursor within the reactor (¶ **[0087]**). The other configuration, illustrated in Figure 4, is designed in a way that causes a mixed solution within the reactor to flow upward (¶ **[0096]**). While one of these two configurations is reverse from the other, it is significant that Ohzuku discloses these two reverse configurations in **separate reactors**. In contrast, Claim 29 recites **a** reactor that includes a first and second set of rotary vanes that induce fluid flow in reverse directions.

Significantly, a cathode active material produced using reverse rotary vanes has a significantly improved charge/discharge capacity compared to a cathode active material produced using either of the Ohzuku reactor configurations. This is shown in the attached Declaration Under 37 C.F.R. § 1.132 ("the Rule 132 Declaration"). The Rule 132 Declaration describes experiments that were specifically conducted to measure how much additional charge/discharge capacity could be achieved by using reverse rotary vanes instead of normal vanes. As expounded in Paragraph 9 and illustrated in Exhibit A of the Rule 132 Declaration, using reverse rotary vanes instead of normal vanes in the reactor can produce an additional charge/discharge capacity of 10 mAh per gram of cathode active material. This is a significant difference that has great industrial value in the field of battery design.

Claim 29 recites a combination of features which is not disclosed by Ohzuku. The Applicant therefore respectfully submits that Claim 29 is allowable over the teachings of Ohzuku, and respectfully requests that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a) (Ohzuku + Watanabe)

The Examiner has rejected Claim 18 under 35 U.S.C. § 103(a) as being obvious based on Ohzuku in view of Japan Patent 9–129230 ("Watanabe"). Claim 18 depends

from, and further defines the invention recited in, Claim 16. Watanabe cannot remedy the shortcomings of Ohzuku as expounded above. The Applicant therefore respectfully submits that dependent Claim 18 is allowable over the combined teachings of Ohzuku and Watanabe for at least the same reasons that independent Claim 16 is allowable over Ohzuku, and respectfully requests that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a) (Ohzuku + Aladjov)

The Examiner has rejected Claims 21 and 28 under 35 U.S.C. § 103(a) as being obvious based on Ohzuku in view of U.S. Patent 5,788,943 ("Aladjov").

Claim 21 depends from, and further defines the invention recited in, Claim 16. Aladjov cannot remedy the shortcomings of Ohzuku as expounded above. The Applicant therefore respectfully submits that dependent Claim 21 is allowable over the combined teachings of Ohzuku and Aladjov for at least the same reasons that independent Claim 16 is allowable over Ohzuku, and respectfully requests that this rejection be withdrawn.

Claim 28 depends from, and further defines the invention recited in, Claim 27. Aladjov cannot remedy the shortcomings of Ohzuku as expounded above. The Applicant therefore respectfully submits that dependent Claim 28 is allowable over the combined teachings of Ohzuku and Aladjov for at least the same reasons that independent Claim 27 is allowable over Ohzuku, and respectfully requests that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a) (Ohzuku + Tanigawa)

The Examiner has rejected Claims 23 and 24 under 35 U.S.C. § 103(a) as being obvious based on Ohzuku in view of U.S. Patent Application Publication 2002/0164527 ("Tanigawa"). Claims 23 and 24 depend from, and further define the invention recited in, Claim 16. Tanigawa cannot remedy the shortcomings of Ohzuku as expounded above. The Applicant therefore respectfully submits that dependent Claims 23 and 24 are allowable over the combined teachings of Ohzuku and Tanigawa for at least the same

reasons that independent Claim 16 is allowable over Ohzuku, and respectfully requests that this rejection be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a) (Ohzuku + Sun)

The Examiner has rejected Claim 25 under 35 U.S.C. § 103(a) as being obvious based on Ohzuku in view of U.S. Patent 6,071,489 ("Sun"). Claim 25 depends from, and further defines the invention recited in, Claim 16. Sun cannot remedy the shortcomings of Ohzuku as expounded above. The Applicant therefore respectfully submits that dependent Claim 25 is allowable over the combined teachings of Ohzuku and Sun for at least the same reasons that independent Claim 16 is allowable over Ohzuku, and respectfully requests that this rejection be withdrawn.

No Disclaimers or Disavowals

Although this communication may include amendments to the application, and may characterize the claim scope and/or referenced art, the Applicant does not concede that previously pending claims are not patentable over the cited references. Rather, any amendments and/or characterizations are being made to facilitate expeditious prosecution of this application. The Applicant reserves the right to later pursue any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history cannot reasonably infer that the Applicant has made any disclaimers or disavowals of any subject matter supported by the present disclosure.

Conclusion

In view of the foregoing, this application is believed to be in condition for allowance, and such allowance is respectfully requested. Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any remaining matters, the Examiner may contact the Applicant's attorney at the number given below.

The Commissioner is authorized (a) to charge LEXYOUME's Deposit Account No. 504054 for any fees required under 37 C.F.R. §§ 1.16 and 1.17 that are not covered, in whole or in part, by a credit card payment form submitted herewith, and (b) to credit any overpayment to said Deposit Account No. 504054.

Respectfully submitted,

/jwkim/

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